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INDIVIDUAL DIFFERENCES IN THE VALUE OF DAIRY COWS.

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Common observation teaches us that different cows produce different amounts of milk and butter-fat in the same period of time, but it does not inform us whether the food consumption differs in proportion to yield, or whether one cow may actually manufacture more than another out of the same amount of feed. The question then arises, will two cows fed on like feeds make the same returns, and, if not, will the yield be in the ratio of the feeds consumed. It was to determine this question that the experiment here described was conducted and the conclusion may be found on page 102.

In experiments of this character the mistake is frequently made of comparing beef cows, or cows with beef tendencies, with dairy cows, for dairy purposes alone. This is unfair to the beef cow, for both she and her offspring are valuable for other purposes than simply the production of milk. The cows used in the experiment here reported were equally of little value for beef as may be seen from the cuts on pages 98 and 99.

TABLE 1. WEEKLY CONSUMPTION OF FEED AND YIELD OF MILK AND BUTTER-FAT IN POUNDS FOR THE TWO COWS FOR ONE YEAR.

1899-1900.	Rose.			Nora.			Rose.			Nora.		
Week ending	Grain.	Hay.	Green feed.	Grain.	Hay.	Green feed.	Lb. milk.	Perct. butter-fat.	Lb. butter-fat.	Lb. milk.	Perct. butter-fat.	Lb. butter-fat.
From April 13												
April 17	61.6	64.1					156.4	4.5	7.04			
April 24	107.7	112.2					290.4	4.8	13.94			
May 1	107.7	112.2					285.0	5.5	15.68			
May 8	107.7	112.2					274.0	5.4	14.80			
May 15	107.7	112.2					311.0	5.2	16.17			
May 22	107.7	112.2					317.0	5.2	16.48			
May 29	107.0	107.0		106.0	107.0		304.5	5.1	15.53	198.6	3.3	6.55
June 5	112.0	112.0		112.0	112.0		315.7	4.8	15.15	218.0	3.3	7.19
June 12	112.0	112.0		112.0	112.0		284.6	4.8	13.66	221.8	3.3	7.32
June 19	112.0	112.0		112.0	112.0		312.7	4.2	13.13	217.9	3.3	7.19
June 26	112.0	100.0	108.0	112.0	100.0	108	294.2	4.2	12.36	213.1	3.4	7.25
July 3	112.0	91 0	209.0	112.0	91.0	209	296.2	3.9	11.55	203.9	3.4	6.93
July 10	112.0	88.0	245.0	122.0	88.0	245	294.1	4.1	12.06	216.5	3.2	6.92
July 17	112.0	84.0	280.0	112.0	84.0	280	289.5	4.2	12.16	216.6	3.2	6.93
July 24	112.0	84.0	280.0	112.0	84.0	280	299.6	4.3	12.88	217.8	3.4	7.40
July 31	112.0	84.0	280.0	112.0	84.0	280	264.2	4.4	11.62	221.4	3.5	7.75
August 7	112.0	84.0	280.0	112.0	84.0	280	267.1	4.4	11.75	225.0	3.4	7.65
August 14	112.0	84.0	280.0	112.0	84.0	280	284.3	4.5	12.79	211.8	3.7	7.84
August 21	112.0	84.0	280.0	112.0	84.0	280	284.2	4.5	12.79	218.3	3.7	8.08
August 28	112.0	84.0	240.0	112.0	84.0	240	264.1	4.6	12.15	203.7	3.7	7.54
September 4	112.0	84.0	210 0	112.0	84.0	210	261.6	4.9	12.82	196.1	3.8	7.45
September 11	112.0	90.0	210.0	112 0	90.0	210	246.7	5.1	12.58	191.2	3.9	7.46
September 18	112.0	84.0	210.0	112.0	84.0	210	252.9	4.6	11.63	191.9	3.6	6.91
September 25	112.0	84.0	210.0	112.0	84.0	210	237.3	5.1	12.10	181.5	3.8	6.90
October 2	104.0	84.0	240.0	112.0	84.0	240	222.2	5.8	12.88	176.0	4.1	7.22
October 9	112.0	96.0	90.0	112.0	96.0	90	213.6	5.4	11.53	166.8	4.1	6.84
October 16	112.0	84 0	210.0	112.0	84.0	210	208.7	5.7	11.89	159.9	4.4	7.03
October 23	112.0	84.0	210.0	112 0	84.0	210	212.0	5.2	11.02	159.4	4.2	6.69
October 30	112.0	84.0	210.0	112.0	84.0	210	205.9	5.0	10.29	151.6	4.0	6.06
November 6	104.0	76.0	230.0	104.0	76.0	230	193.5	5.5	10.64	143.6	4.2	6.03
November 13	84.0	56.0	280.0	84.0	56.0	280	199.3	5.2	10.36	152.4	4.2	6.40
November 20	84.0	56.0	280.0	84.0	49.0	280	202.5	5.6	11.34	151.0	4.0	6.04
November 27	84.0	56 0	280.0	84.0	36.0	280	187.7	5.1	9.57	125.2	4.1	5.13
December 4	84.0	56.0	280.0	84.0	32.0	280	178.0	5.1	9.08	132.6	4.1	5.44
December 11	84.0	50.0	280.0	78.0	36.5	280	155.1	5.1	7.91	134.4	4.1	5.51
December 18	80.0	4.0	399.0	62.0	0.0	385	165.0	5.1	8.42	94 1	4.1	3.86
December 25	70.0	0.0	465.0	70.0	0.0	461	153.0	5.2	7.96	107.2	4.5	4.82
January 1	70.0	6.0	438.5	70.0	0.0	427	116.8	5.4	6.31	97.2	4.6	4.47
January 8	76.0	51.0	325.0	76.0	26.0	325	137.1	5.4	7.40	109.4	4.2	4.59
January 15	84.0	56.0	280.0	84.0	42.0	280	142.8	5.2	7.42	114.7	4.3	4.93
January 22	84.0	53.5	280.0	84.0	23.5	280	153.5	5.2	7.98	110.7	3.9	4.32
January 29	84.0	52.5	280.0	84.0	27.5	280	142.8	5.4	7.71	104.4	4.4	4.59
February 5	79.0	55 0	280.0	79 0	45.0	280	135.2	5.4	7.30	107.2	4.2	4.50
February 12	70.0	56.0	280.0	70.0	56.0	280	145.5	5.2	7.56	105.5	4.1	4.32
February 19	70.0	56.0	280.0	70.0	56 0	280	143.9	5.6	8.06	113.6	4.2	4.77
February 26	70.0	56.0	280.0	70.0	38.0	280	139.7	5.4	7.54	101.1	4.1	4.14
March 5	70.0	56.0	280.0	70.0	37.5	280	154.4	5.6	8.65	94.9	4.4	4.17
March 12	70.0	56.0	280.0	70.0	45.0	280	134·7	5.8	7.81	110.1	4.4	4.84
March 19	70.0	56.0	280.0	70.0	46.0	280	127 4	5.4	6.88	106.0	4.4	4.66
March 26	70.0	56.0	280.0	70.0	46 5	280	127.4	6.1	7.77	102.3	4.3	4.40
April 2	70.0	56.0	280.0	51.0	40.0	200	129.1	6.0	7.75	90.1	4.0	3.60
April 9	70.0	56.0	280.0	70.0	56.0	280	135.3	6.0	8.12	99.1	4.3	4.26
April 13	40.0	32.0	160.0				79.6	6.1	4.85			
April 16				70.0	51.0	244				98.8	4.3	4.25
April 23				70.0	100.0					88.9	4.4	3.91
April 30				70.0	106.0					87.4	4.4	3.84
May 7				70.0	112.0					98.5	4.3	4.23
May 14				70 0	104.0					96.4	3.5	3.37
May 22				80.0	120.0					103.8	4.0	4.15
Total							11329.		564.82	7759.4		298.64

Description of the Cows.

Two cows named Rose and Nora were selected for the experiment. They were both grade cows of no known breeding and nearly solid red in color. Rose was nine years old and was fresh April 10, 1899. Nora was six years old and was fresh May 19, 1899.

Method of Conducting the Experiment.

Rose, the better cow, was fresh thirty-nine days before Nora and the record of each was commenced three days after calving and continued one year. The two cows were fed exactly the same kinds of feed and in the same proportions, with the exception of a very slight difference during the time they were not both giving milk, as may be noted in Table I, which was the first thirty-nine days of Rose's lactation period and the last thirty-nine days of Nora's. Any other slight difference in feed comes from a small amount being left uneaten and weighed back. They were not crowded at any time, being fed only twice a day. For a time it was impossible to get a very good quality of clover hay and occasionally some was left uneaten which, after becoming thoroughly dried of any moisture that might have collected on it during feeding, was weighed and subtracted from the amount fed. The cows received like treatment in every respect, standing during the winter in stalls side by side and in suitable weather being turned each day into a yard. During the summer they had access to a shady yard, always being tied in their stalls at feeding time in order that the amount each consumed could be accurately determined. They were milked at regular intervals each day and always by the same milker. The weight of each milking was recorded and a sample taken with a Scovell sampling tube, which removes an aliquot part from each milking, The samples thus taken were put into glass jars each bearing the respective cow's name and containing a small quantity of potassium bi-chromate to prevent the milk from souring. At the close of the week the jar for each cow had received a sample of every milking and the composition of this composite sample represented the average composition of the milk given by that cow for the week. The composite samples were tested in duplicate for butter-fat by the Babcock test and the total weight of milk for the week was multiplied by the per cent. of butter-fat in the composite sample which gives the weekly yield of butter-fat for each cow.

The complete data for each week as to feeds consumed, and milk and butter-fat produced, are given in Table I.

ROSE.

ROSE.

The Feed.

The ration was composed of hay, green feed, and ground feed. The hay was a fair quality of clover. The green feed was changed from time to time as the season required. The concentrates consisted of a mixture of several different kinds of ground feed. The percentage of each in the mixture and the length of time each mixture was fed are given in the table below.

Nora.

Table 2. Percentage Composition of Grain Ration for Different Periods by Weight.

1899 and 1900	Corn meal	Gluten meal	Wheat bran	Ground oats	Oil meal
April 13, to November 6.....	33⅓	.....	33⅓	16⅔	16⅔
November 6, to February 5....	41⅔	33⅓	.....	.....	25
February 5, to April 13.....	25	25	25	18¾	6¼
April 13, to May 22.....	44⅘	17⅗	26⅔	.....	11⅓

The green feed consisted of rape until August 28th, green corn until September 11th, cowpeas until October 9th, and then corn silage for the remainder of the experiment.

TABLE 3. AMOUNT IN POUNDS OF EACH KIND OF FEED CONSUMED FOR THE PERIOD GIVEN.

ROSE.

Date for each period	Clover hay	Corn silage and green corn	Green rape	Green cowpeas	Corn meal	Wheat bran	Oats	Gluten meal	Linseed meal O. P.
Apr. 13 to May 22	625.1	.....	.....	....	200.	200.	100.	.....	100.
May 22 to Nov. 6	2160.	1280.	2482	750	889.	889.	444.5	.....	444.5
Nov. 6 to Feb. 5	552.	4147.5	.....	....	436.2	.....	.....	349.	261.7
Feb. 5 to Apr. 13	536.	2680.	.....	....	167.5	167.5	125.6	167.5	41.8
	3873.1	8107.5	2482	750.	1692.7	1256.5	670.1	516.5	848.0

NORA.

Date for each period	Clover hay	Corn silage and green corn	Green rape	Green cowpeas	Corn meal	Wheat bran	Oats	Gluten meal	Linseed meal O. P.
May 22 to Nov. 6	2160.	1280.	2482.	750.	891.3	891.3	445.6	.....	445.6
Nov. 6 to Feb. 5	373.5	4118.	.....	....	426.2	.....	.....	341.	255.7
Feb. 5 to Apr. 13	450.	2579.4	.....	....	162.7	162.7	122.	162.7	40.7
Apr. 13 to May 22	564.	104.6	.....	....	173.3	104.	.....	69.3	43.3
	3547.5	8082.0	2482.	750.	1653.5	1158.0	567.6	573.0	785.3

THE AMOUNT IN POUNDS WHICH ROSE CONSUMED MORE THAN NORA.

	Clover hay	Corn silage and green corn	Green rape	Cowpeas	Corn meal	Wheat bran	Oats	Gluten meal	Linseed meal O. P.
	325.6	25.5	.....	.....	39.2	98.5	102.5	—56.5	62.7

TABLE 4. AMOUNT OF DIFFERENT CLASSES OF DIGESTIBLE NUTRIENTS CONSUMED IN EACH KIND OF FEED FOR BOTH COWS.

ROSE.

Feed	Pounds	Pounds dry matter	Pounds digestible			Pounds total digestible dry matter
			Protein	Carbohydrates	Fat	
Clover hay	3873.1	3280.52	263.37	1386.57	65.84	1715.78
Silage and green corn	8107.5	1694.47	72.97	916.15	56.75	1045.87
Rape	2482.	347.48	37.23	201.04	4.96	243.23
Green cowpeas	750.	123.	13.50	65.25	1.50	80.25
Corn meal	1692.7	1513.27	132.03	1129.03	72.78	1333.84
Wheat bran	1256.5	1101.95	154.55	466.16	32.67	653.38
Oats	670.1	596.39	61.65	316.96	28.14	406.75
Gluten meal	516.5	474.15	133.26	223.64	56.81	413.71
Linseed meal O. P.	848.	769.98	248.46	277.29	59.36	585.11
	20196.4	9901.21	1117.02	4982.09	378.81	6477.92

NORA.

Feed	Pounds	Pounds dry matter	Pounds digestible			Pounds total digestible dry matter
			Protein	Carbohydrates	Fat	
Clover hay	3547.5	3004.73	241.23	1270.	60.31	1571.54
Silage and green corn	8082.	1689.14	72.74	913.27	56.57	1042.58
Rape	2482.	347.48	37.23	201.04	4.96	243.23
Green cowpeas	750.	123.	13.50	65.25	1.50	80.25
Corn meal	1653.5	1478.23	128.97	1102.88	71.10	1302.95
Wheat bran	1158.	1015.57	142.43	429.62	30.11	602.16
Oats	567.6	505.16	53.22	268.47	23.84	345.53
Gluten meal	573.	526.01	147.83	248.11	63.03	458.97
Linseed meal O. P.	785.3	713.05	230.09	256.79	54.97	541.85
	19598.9	9402.37	1067.24	4755.43	366.39	6189.06

DIFFERENCE IN THE AMOUNTS CONSUMED BY THE TWO COWS FOR ONE YEAR.

Pounds	Pounds dry matter	Protein	Carbohydrates	Fat	Pounds total digestible dry matter
597.5	498.84	49.78	226.66	12.41	288.82

As the object of the experiment was the comparison of the two cows and as they were fed the same kinds of feed and each cow consumed practically the same amount of each, the exact chemical composition of the feed is not important; hence no analyses were made but those given in the standard tables in Henry's "Feeds and Feeding" were used.

In order to facilitate the comparison, as the ratios of the different total digestible nutrients in the feed consumed by each cow are practically the same, all feed was reduced to the basis of total digestible nutrients consumed.

TABLE 5. RECORD OF THE TWO COWS FOR ONE YEAR COMPUTED ON A LIKE FEED BASIS.

	Rose	Nora	Difference
Reduced to a like feed basis the amount Nora would have produced had she eaten the same as Rose.			
Total digestible dry matter consumed, in pounds..	6477.92	6477.92	.....
Total yield of milk in pounds.....	11329.00	8121.60	3207.40
Total yield of butter fat, in pounds.....	564.80	312.53	252.27
Total yield of butter, in pounds.....	658.90	364.62	294.28
Total value of butter at 16c. per pound	$105.43	$58.34	$47.09

Reduced to a like feed basis, for every 100 lb. of milk given by Nora, Rose gave 139.5 lb. and for every 100 lb. of butter-fat produced by Nora, Rose produced 180.7 lb.

COMPARATIVE VALUE OF THE TWO COWS.

As milk is nearly always valued by the amount of butter-fat which it contains and Rose produced on the same feed basis 1.807 times as much butter-fat as Nora, the difference in yield between the two cows was 252.27 lb. of butter-fat or 294.31 lb. of butter per year. This at 16 cents per pound, which is the average value of butter before being made up would amount to $47.09 per year. Supposing that the cows would yield in this ratio for six years, from the age of four to ten, which is a conservative estimate, Rose would produce $282.54 worth of butter more than Nora on exactly the same kind and quantity of feed. The descendants of Rose are also of vastly more value than those of Nora.

In this comparison Rose was at a disadvantage in two ways. She was nine years of age and on the down grade of life while Nora was just in her prime. Rose was bred November 5, 1899, while Nora was not bred until after the experiment closed. Had it not been for these two hindrances Rose would doubtless have made even a better record than she did.

While there is a vast difference in the profit derived from the two cows in this experiment the difference is by no means phenomenal, as greater differences than here cited may frequently be found among cows in the same herd, for the cow Nora, the

poorer of the two, was in reality an exceptionally good cow, producing 348.4 lb. of butter in a year which is nearly three times the average yield (130 lb.) of cows in the United States and almost one-half more than the average yield (250 lb.) of profitable cows in Illinois. Had Rose been compared with a really poor cow, such as may be found in nearly all dairy herds, there would have been a much greater difference in profit in favor of Rose; for she gave nearly five times as much as the average cow, and more than two and one-half times as much as a profitable cow for Illinois.

While Rose is an exceptionally good cow it is not difficult to find those which will produce butter-fat even more economically. For example; in a thirty-two-day test with Miss Gypsy, another cow in the Station herd, both being thirty days from calving, fed on like feed and the computation being on the same feed basis, when Rose yielded 1 lb. of butter-fat Miss Gypsy yielded 1.4 lb. and gained during this period over 100 lb. in body weight, while Rose's gain was but slight. When Nora, under conditions mentioned, produced 1 lb. of butter-fat Miss Gypsy produced 2.44 lb. on the same feed.

Weight of Cows.

Cows vary in weight from day to day owing to variations in the amount of water drunk and other conditions. The cows under experiment were, therefore, weighed monthly on each of five consecutive days, the last two of one month and the first three of the next, and the average of these five weights taken as the correct weight for the first of the month. From August first to April first Rose gained 181 lb. in body weight while Nora gained 165 lb. in the same length of time, or 16 lb. less than Rose, showing that Nora did not utilize her feed above Rose in putting on body gain.

What Became of the Food.

As before mentioned Rose produced 1.8 lb. of butter-fat and 1.39 lb. of milk for every pound of butter-fat and milk given by Nora on the same feed and with no more body gain. The important question then arises, what did Nora do with this extra amount of feed which she consumed? Several answers suggest themselves. Either Nora used up a larger amount of food in nervous energy, or she failed to digest her food as completely, or else it was lack in ability of the glands of the udder to elaborate the milk from the blood. It could scarcely be the first as they were both quiet cows; if anything, Nora had the more contented disposition of the two.

To have determined their relative efficiency in digesting food

would have necessitated a digestion experiment which would be of great value in this connection, but which, owing to lack of funds, it was impossible to conduct at the time. It is intended, however, to carry on such an experiment during the coming year.

Have a Profitable Standard.

A prominent dairy authority has recently said: "If the death angel should sweep over the state and in one night destroy the poorest third of all the cows in Illinois, the dairymen would awake the next morning financially better off." Frequently dairymen are keeping one-half of their herd at an actual loss. They are perhaps making a little profit on the whole herd and are thus apparently satisfied, whereas, if they would dispose of their unprofitable cows they would make more money and also save labor. If in a town having two grain elevators, one paid one-half cent a bushel more for grain than the other, no farmer would be foolish enough to sell his grain at the one paying the lower price. Yet dairymen will persist in keeping cows year after year that are paying them only twenty-five cents a bushel for grain, while others in the same herd, or that can easily be obtained at a reasonable price, will pay fifty cents a bushel or even more for the grain they consume. The difference in price which individual cows are paying for their grain is not so apparent as the difference at the elevators, but it is none the less actual and affects the pocket-book just as surely in the end.

Every dairyman should have a profitable standard of production for his cows, and any mature cow that does not come up to this standard should be disposed of at once. What this profitable standard is each must determine for himself, as it will depend upon the cost of feed and care, and the value of the product in that particular locality. This standard should be gradually raised each year by weeding out the poorest cows and breeding only from the best. The only way this can be done intelligently is by keeping a record of each individual cow. Generally speaking, cows cannot be kept at a profit in Illinois that do not produce the equivalent of 250 lbs. of butter annually.

Keeping Records of Individual Cows.

To determine exactly what a cow produces in a year, every milking must be weighed and sampled, but if the herd is given a one-week test every three months it will be sufficient to yield valuable results. All the apparatus necessary for this purpose is a spring balance, as many common glass fruit jars as there are cows in the herd, and a four-bottle Babcock milk tester. The latter can

be purchased from any creamery supply house complete for four dollars. A set of directions accompanies the tester, and by following these any intelligent person can operate the test. The milk may be weighed on any scale, but a spring balance is the most convenient. The scale should be so adjusted that it will balance the empty milk pail with the hand at zero as shown in the cut. The weight of the milk may then be read directly from the scale without subtracting the weight of the pail and may be quickly

Scale for Weighing Milk. Record Sheet and Composite Samples.

recorded opposite the cow's name on the milk sheet provided for the purpose and placed on the wall convenient to the scale. A sample should then be taken by means of a small dipper holding about two tablespoonfuls and placed in the jar bearing the cow's name or number. A cartridge shell of the proper size, with a wire attached for a handle, makes a very convenient dipper for this purpose. If things are conveniently arranged this can all be accomplished very quickly. To prevent the milk from souring until the end of the week, to each glass jar should be added as much pulverized potassium bi-chromate as will lie on a one cent piece. Potas-

sium bi-chromate may be obtained at any drug store, and, although a rank poison, is one of the best preservatives to use for this purpose for the reason that it imparts a lemon color to the milk, thus making it easy of detection and obviating the possible mistake of feeding it to calves or pigs.

At the end of the week the composite samples in the jars are tested with the Babcock milk test to determine the per cent. of butter-fat. This gives the average amount of butter-fat contained in each cow's milk for the week. The total weight of the milk for the week, multiplied by the per cent. of butter-fat, gives the total butter-fat produced by that cow for the week.

This test should be made every three months, or thirteen weeks, and in computing the yield of the cow for the three months the six weeks previous to and the six weeks following the test should be taken, for obvious reasons, and not the three months before or the three months after. Even if the cow is shrinking in flow the week in the middle of the three months will fairly represent her average yield for that period.

After a fair trial all mature cows that do not come up to a profitable standard should be disposed of at once. A heifer may not do well with her first calf, but if she is a promising individual in other respects she should still be retained. If, however, she is a poor producer during her second lactation period, she should be kept no longer.

After the cows have been tested for a year and the best ones determined, these should be bred to a sire of some dairy breed, one that is both an excellent individual and whose female ancestors for several generations have been large producers. In no class of animals is the pedigree of so much importance as in the dairy sire. In others something can be told of the sire's individual merit for the purpose for which he is kept. The speed stallion can be tested on the track, the wool ram by examining his fleece, and all flesh producing animals by the development of the high priced portions of their bodies, while the ability of the dairy bull to produce good milkers must be determined almost entirely by the record of his ancestors. Again, in no class of animals do we have the opportunity to determine the individual merit of the females from a standpoint of production as in dairy cattle. An exact record of the yield for the entire year may be easily kept and the animal's actual worth be determined while still comparatively young and without destroying the animal as is necessary for the block test. The old saying: "The sire is half the herd," does not always express the whole truth. In a sire whose ancestors have been bred for dairy

purposes only, these characteristics have become firmly fixed and when crossed on cows of no special breeding will produce calves more like the sire than the dam. In this case the sire counts for more than half. A dairyman may start with nothing but grade cows of only fair quality and by simply purchasing dairy sires of excellent quality have a fine grade dairy herd in a few years. Too much stress cannot be laid on this point and money and time spent in finding an excellent sire will prove a remunerative investment.

The heifer calves from the best cows should by all means be raised. The method that is still quite largely practiced in some

COMPOSITE SAMPLES OF MILK AND APPARATUS FOR TESTING.

portions of the dairy sections of our state, of disposing of all the calves regardless of how good the individual or its parentage, is in the end a ruinous practice to the dairy interests. The ranges are producing beef cattle, horses, and sheep; but there is no one as yet in the business of producing good working cows of high quality and the supply must be produced by the dairymen themselves. Although good cows can be found in all communities they are comparatively scarce and the heifer calves from them should certainly

be raised. Where the whole milk is disposed of and no skim milk is available this is not so easily done but it will pay to feed the best calves whole milk for a few days and then gradually substitute some other calf food. In this way, if a little care is exercised, excellent dairy calves may be raised on a small quantity of milk.

SUMMARY.

There are vast differences in the efficiency and profit derived from individual dairy cows.

One cow may produce more than twice as much butter-fat in a year as another on exactly the same feed basis.

A good cow, well cared for, may produce five times as much as the average cow in the United States, or nearly as much as three "profitable" cows for Illinois.

Nearly all dairymen are keeping a portion of their herd at an actual loss.

Many keep cows that pay only half as much a bushel for the grain consumed as other cows in the same herd.

Excellent cows are obtainable at a reasonable price in nearly all sections of the country. (There is almost no dairying in this region, yet the cow Rose and several others nearly as good were purchased in this community for fifty dollars each.)

Give the cows a one-week test every three months; have a profitable standard; gradually raise it each year and dispose of any cows that do not come up to this.

Breed the best cows to a dairy sire of excellent breeding and individuality and raise the heifer calves.